

MAN's production in top gear



▲ (From left) Joachim Koller of Technical Service at Seco, Tobias Oberprieler, Segment Manager at MAN Commercial Vehicles, Dr.-Ing. Jörg Grams, Department Manager, and Gerhard Huber, Seco's Sales and Customer Care Manager – in front of the vertical machining centre used for the machining operations.

Competitive pressure in the automotive industry is particularly intense these days – companies focus constantly on reducing their costs and maximizing production efficiencies. MAN Commercial Vehicles, Munich shows that it is possible to gain considerable increases in productivity without making large investments.

MAN Commercial Vehicles were looking to increase the productivity of their axles and transmission department by ten per cent for 2006 to produce 105,000 powered axles. In the section that turns and hard-machines ring gears made of 25 Mo Cr 4E material, bottlenecks often formed which threatened to make productivity improvement impossible.

Tobias Oberprieler, in charge of production scheduling at MAN, decided to test an alternative manufacturing method to solve the problem. Specially soldered single-

pointed CBN tools had been used on an EMAG VSC 500 vertical machining centre until Seco Tools was commissioned to develop an alternative tooling system, employing round CBN indexable cutting inserts. The solution produced immediate results.

Joachim Koller, responsible for technical service at Seco says: "Because of the round insert, the cutting edge has a larger radius which in turn allows higher feed rates. The round inserts are initially more expensive to purchase, but because the cutting edge can be changed simply by turning the insert in the tool holder, in the end

they deliver considerable savings."

Next, a special turning tool manufactured by Seco's plant in Erkrath, Germany was further optimized to incorporate a new vibration-reducing mount with a round insert, which can normally offer up to 14 cutting edges. The 14 cutting edge positions are marked with laser markings so that no positioning errors occur and the cutting edges of the insert are used to the full.

Better all round

Oberprieler explains the machining process: "The ring gears are rough-



▲ Both machining tasks involved hard-machining of the end faces outside and inside and intermittent hard-machining of the end faces.

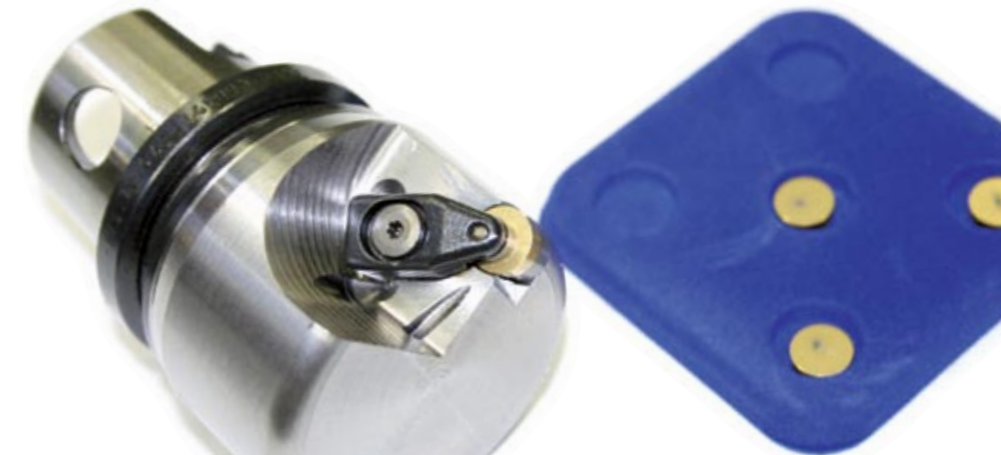
turned, toothed, hardened and then prepared for finish machining by hard turning. The face machining is an interrupted cut over holes and an inner through-bore, which must have a smooth finish. The oversize on the plane faces is 0.2 to 0.3mm.

Savings were achieved due to a reduction of the machining time (by 40 per cent) as a result of the significantly higher feed-rates. Tool cost was also greatly reduced thanks to the longer cutting edge and the fact that on the round inserts we can use up to 20 edges, not just the 14 that Seco promised. This means that set-up times have been reduced and that machine times can be used to their maximum productive effect."

Department Manager Dr.-Ing. Jörg Grams adds: "With the new tool system based on the round CBN indexable inserts, not only can cost savings be achieved, but there is a noticeable increase in productivity. This ultimately brings about an increase in capacity, without having to invest in a new machines and operators".

Key to success

Gerhard Huber, Seco's Sales and Customer Care Manager sums it up: "The extremely stable cutting edge of the round insert is the key to success in terms of productivity. Combined with the quality of the CBN100P



▲ The turning tool holder with round cutting insert and 14 (20) cutting edges; a laser marking makes the correct cutting indexing more visible.

cutting material, this allows excellent results in hard, intermittent cutting applications. Because we had already seen great success with similar tooling on smaller passenger-car ring gears, we figured that the odds of success for MAN were pretty good. The new turning tool system with round CBN disks has been used for a while now at MAN and proven itself in the full 3-shift operation".

In 2005 MAN produced 93,000 axles, 6,000 distributor gears, 41,000 through drives, 3,500 wheel hubs and 400 hydrostatic front-wheel drive transmissions.

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▲ MAN is one of Europe's leading manufacturers of commercial vehicles producing trucks, buses and coaches and a range of marine and vehicle engines.